

# PATENT APPLICATION

## BREATH FRESHENER WITH MOUTHWASH ATOMIZER

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# **BREATH FRESHENER WITH MOUTHWASH ATOMIZER**

*by Inventors*

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## **BACKGROUND**

### **Technical Field**

[0001] Embodiments of the invention generally relate to breath freshening products. More particularly, embodiments relate to an apparatus that applies a mist of mouthwash to the bristles of a toothbrush in order to facilitate breath freshening.

### **Discussion**

[0002] The desirability of fresh breath is well understood throughout modern society. Indeed, breath freshening products have been in existence for quite some time. Although many of these products have proven to be effective under certain circumstances, a number of difficulties remain.

[0003] One such difficulty relates to mobility. For example, the trend toward mobile phones, wireless networking and untethered computing typifies the need for a breath freshening technique that provides the maximum of freedom of movement. Unfortunately, traditional products such as mouthwash and toothbrushes typically require the user to spit (e.g., into a sink) the liquid remnants of the breath freshening products. Indeed, most toothbrushes require running water to wet the toothpaste and bristles before and after use. While more complex toothbrushing systems, such as the system described in U.S. Patent No. 6,331,088 to Owens have internal pumping mechanisms to wet the bristles of the toothbrush, the user still needs a place to dispel the toothpaste, mouthwash and antibacterial rinse from his or her mouth. Such systems are therefore clearly designed for bathroom use. If a sink or other adequate receptacle is not available, the user may be forced to swallow the remnants, which can be harmful.

[0004] Other products such as mints require the user to swallow some or all of the dissolved mint, which may result in undesirable calorie intake and/or other dietary drawbacks. Even chewing gum has practical limitations due to the general societal disapproval of chewing in public. Mints and gum can also take a certain amount of time to take effect, where instantaneous

results may be desired. In addition, conventional mints and gum simply cover up bad breath instead of eliminating the bacteria that causes the odor. As a result, these products are typically effective for only a short period of time. There is therefore a need for an instantaneously effective and long lasting breath freshening product that does not require running water or spitting, and eliminates the need to chew or swallow.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

[0005] The various advantages of embodiments of the present invention will become apparent to one skilled in the art by reading the following specification and appended claims, and by referencing the following drawings, in which:

[0006] FIG. 1 is a side view of an example of a breath freshening apparatus according to one embodiment of the invention;

[0007] FIG. 2 is a side view of an example of the breath freshening apparatus shown in FIG. 1 with the cap coupled to the toothbrush over the bristles according to one embodiment of the invention;

[0008] FIG. 3 is a sectional view of an example of the breath freshening apparatus shown in FIG. 1 according to one embodiment of the invention;

[0009] FIGS. 4A and 4B are enlarged views of an example of an atomizing pump according to one embodiment of the invention;

[0010] FIG. 5 is a side view of an example of a breath freshening apparatus according to an alternative embodiment of the invention; and

[0011] FIG. 6 is an enlarged view of an example of a set of bristles having a mist of mouthwash applied according to one embodiment of the invention.

### **DETAILED DESCRIPTION**

[0012] FIGS. 1-3 show a breath freshening apparatus 10 that is portable, compact and eliminates the need for rinsing, spitting, and digesting. Generally, the apparatus 10 includes a toothbrush 12 having bristles 14 and a reservoir 16 containing mouthwash 18. The mouthwash 18 can be any commercially available mouthwash. The apparatus 10 also has an atomizer 20 coupled to the reservoir 16 and the bristles 14. Actuation of the

atomizer 20 results in a mist of the mouthwash 18 being applied to the bristles 14. By applying a mist of the mouthwash 18 to the bristles 14, as opposed to merely pumping the mouthwash 18 to the bristles 14 in liquid form, the apparatus 10 obviates the need of spitting or swallowing excess liquid. As a result, the apparatus 10 presents a completely unique approach to breath freshening that rivals the convenience of gum and mints without the shortcomings of these traditional products.

**[0013]** The illustrated atomizer 20 has an induction tube 22 having a first end 24 disposed within the reservoir 16. An atomizing pump 26 is coupled to a second end 28 of the induction tube 22. A delivery tube 30 is disposed between the atomizing pump 26 and the bristles 14. It should be noted that alternatively, the delivery tube 30 can be eliminated by merely using the internal walls of the passageway extending between the bristles 14 and the atomizing pump 26.

**[0014]** Turning now to FIGS. 4A and 4B, one approach to the atomizer pump 26 is shown in greater detail. Pump 26 has a structure similar to that of the pump described in U.S. Patent No. 4,434,916 to Ruscitti, et al. Generally, FIG. 4A shows the atomizing pump 26 at rest (i.e., just before actuation), and FIG. 5 shows the atomizing pump 26 at its greatest stroke (i.e., just after actuation). The illustrated atomizer pump 26 has surfaces defining a metering chamber 32, a nozzle 34, and a pressurization passageway 36. The metering chamber 32 receives the mouthwash from the induction tube 22 (FIG. 3). It can be seen that during actuation (FIG. 4B), the pressurization passageway 36 extends between the metering chamber 32 and the nozzle 34, whereas during non-actuation (FIG. 4A), the pressurization passageway 36 is closed off by seal 38. During actuation, the pressurization passageway 36 receives the mouthwash 18 from the metering chamber 32 and injects airborne particles 40 of the mouthwash 18 into the nozzle 34. The pump 26 also has surfaces defining priming passageways 42, where the priming passageways 42 enable ambient air to enter the reservoir 16 (FIG. 3) during actuation of the pump 26.

**[0015]** While the illustrated atomizing pump 26 has a relatively sophisticated design with metering and priming functionality, the invention is not so limited. Indeed, any atomizer capable of breaking up a liquid into particles small enough to become airborne can be used. An example of alternative approach is shown in U.S. Patent No. 5,348,194 to Mascitelli et al., incorporated herein by reference.

[0016] FIG. 6 shows an enlarged view of bristles 14 having particles 40 of the mouthwash applied in the form of a mist. The term “mist” is used herein to refer to particles of a liquid that are small enough to become airborne.

[0017] Returning now to FIGS. 1-3, it can be seen that the illustrated toothbrush 12 has a first housing 44 and a second housing 46 containing the reservoir 16. Longitudinal manipulation of the housings 44, 46 relative to one another results in actuation of the atomizer 20 because the nozzle 34 (FIGS. 4A & 4B) of atomizer 20 is fitted into an opening formed in the interior of the first housing 44. The housings 44, 46 also have locking surfaces 48 to selectively prevent actuation of the atomizer 20. Specifically, a protrusion on the external surface of the second housing 46 mates with an indentation on an internal surface of the first housing 44 to provide a “twist-and-lock” functionality. It can also be seen that priming passageways 42 are formed in the first housing 44 to further enable ambient air to enter the reservoir during the actuation of the atomizer pump.

[0018] The illustrated apparatus 10 also has a cap 50 having a generally inboard end 52 and an outboard end 54. One embodiment provides the cap 50 with a cleaning ridge 56. The cleaning ridge 56 removes excess mist from the bristles 14 if the cap is coupled to the toothbrush 12 over the bristles 14. The outboard end 54 also has surfaces defining evaporation apertures 58 to enable the excess mist to evaporate. The outer surface of the cap 50 also has a striated area 60 and a smooth area 62, where the smooth area 62 enables display of a printed message such as a logo. The striated area 60 facilitates gripping of the apparatus 10, while the smooth area 62 enhances the potential for advertising.

[0019] FIG. 5 shows an alternative breath freshening apparatus 10' with a somewhat simplified design. Specifically, the toothbrush 12' has a modified reservoir, wherein the reservoir has resilient sidewalls 64. Laterally manipulating (e.g., “squeezing”) the sidewalls 64 results in actuation of the atomizer. Since the modified apparatus 10' may be more prone to leakage, a modified cap 50' is provided, where the evaporation apertures are removed to provide a hermetically-sealed arrangement.

[0020] A user can therefore apply a mist of the mouthwash to the bristles 14 of a toothbrush, by actuating an atomizer that is built into the toothbrush, and quickly brush his or her teeth so that the mist is transferred to the interior of the mouth. The result is a feeling of “freshness” and reduction in odor similar to the results achievable through the

use of gum and/or mints. In fact, the use of mouthwash eliminates the bacteria that causes the odor, and results in longer lasting effects. It should also be noted that the embodiments described herein do not require the user to chew gum or swallow the dissolved remnants of a mint. Furthermore, instantaneous results can be achieved without the need of prolonged use, as in the case of gum or mints.

[0021] Those skilled in the art can now appreciate from the foregoing description that the broad techniques of the embodiments of the present invention can be implemented in a variety of forms. Therefore, while the embodiments of this invention have been described in connection with particular examples thereof, the true scope of the embodiments of the invention should not be so limited since other modifications will become apparent to the skilled practitioner upon a study of the drawings, specification, and following claims.